DOCKETED

Docket Number:	19-AB-2127
Project Title:	Implementation of AB 2127 Electric Vehicle Charging Infrastructure Assessments
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Agenda

1) Welcome and Introductions

2) EVI-Pro model methodology, inputs and assumptions, and outputs

3) Scenarios and analysis for second Assembly Bill 2127 assessment

4) Q&A and Public Comment

Housekeeping

- Workshop is being recorded

- Workshop Event Webpage:

  https://www.energy.ca.gov/event/workshop/2022-03/electric-vehicle-infrastructure-projections-evi-pro-assembly-bill-ab-2127

- Written Comments to Docket # 19-AB-2127:

  https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-AB-2127

  Deadline: Friday, March 25, 2022

EVI-Pro Methodology

EVI-Pro Flow Diagram
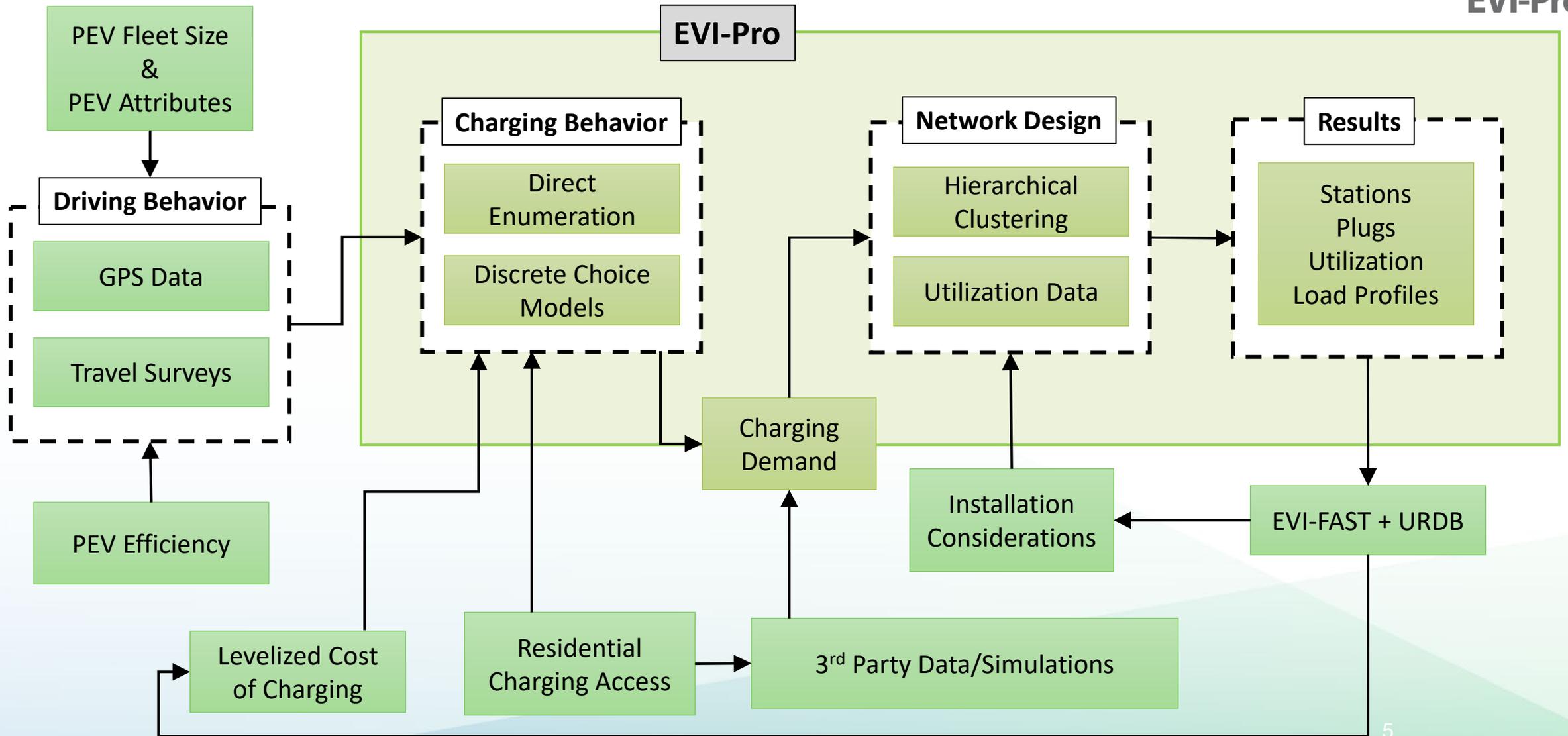
EVI-Pro Inputs and Assumptions

Fleet Scenarios in 1st AB 2127 Report

Chart showing Total ZEVs from 2020 to 2030 for three scenarios:
- EAD Low Scenario (gray)
- EAD Aggressive Scenario (orange)
- CARB Mobile Source Strategy (yellow)
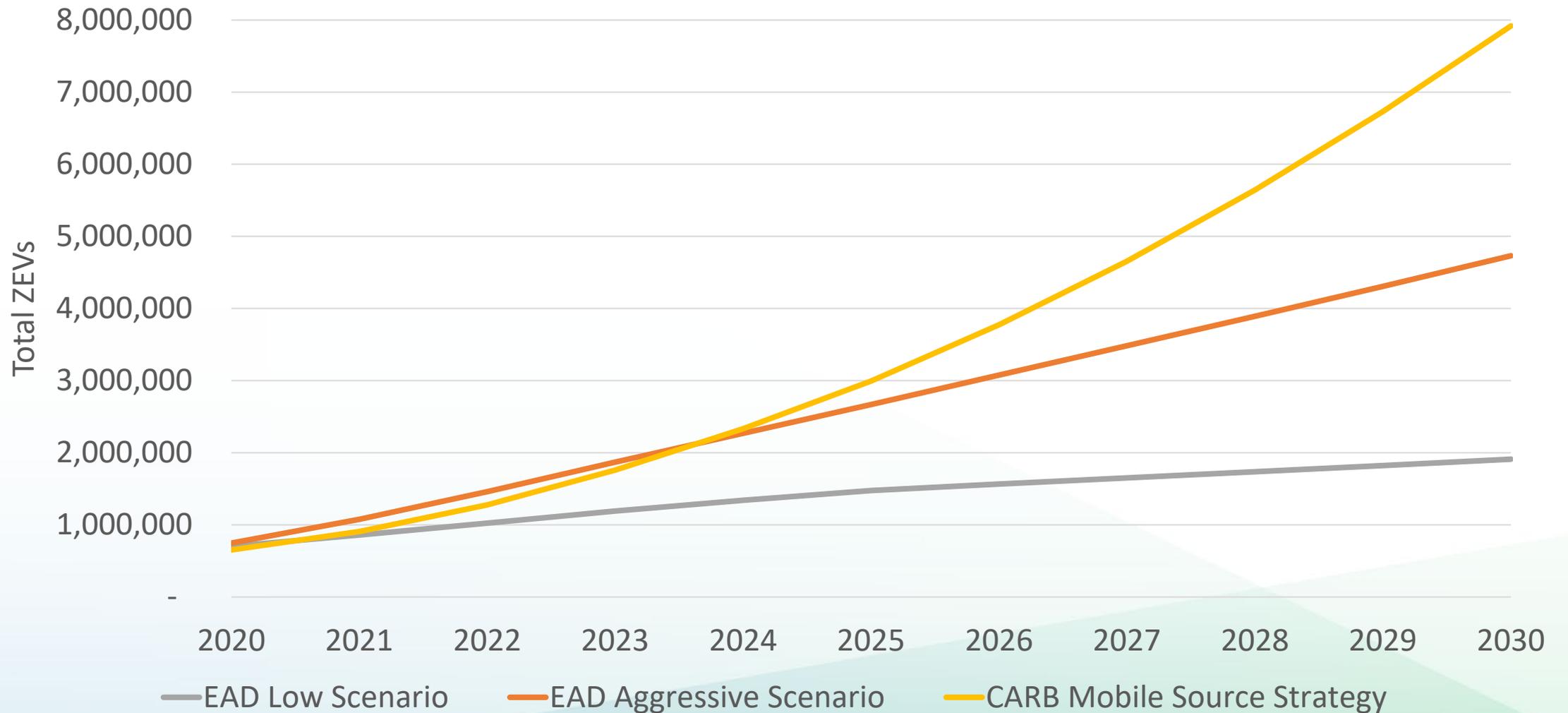
Fleet Scenarios in 2nd AB 2127 Report

Chart: "Number of PEVs" (y-axis, 0 to 16,000,000) vs. year (x-axis, 2020 to 2034) showing three scenarios:
- 2021 IEPR EAD Aggressive (blue)
- CARB Mobile Source Strategy (orange)
- CARB Draft ACC2 (gray)
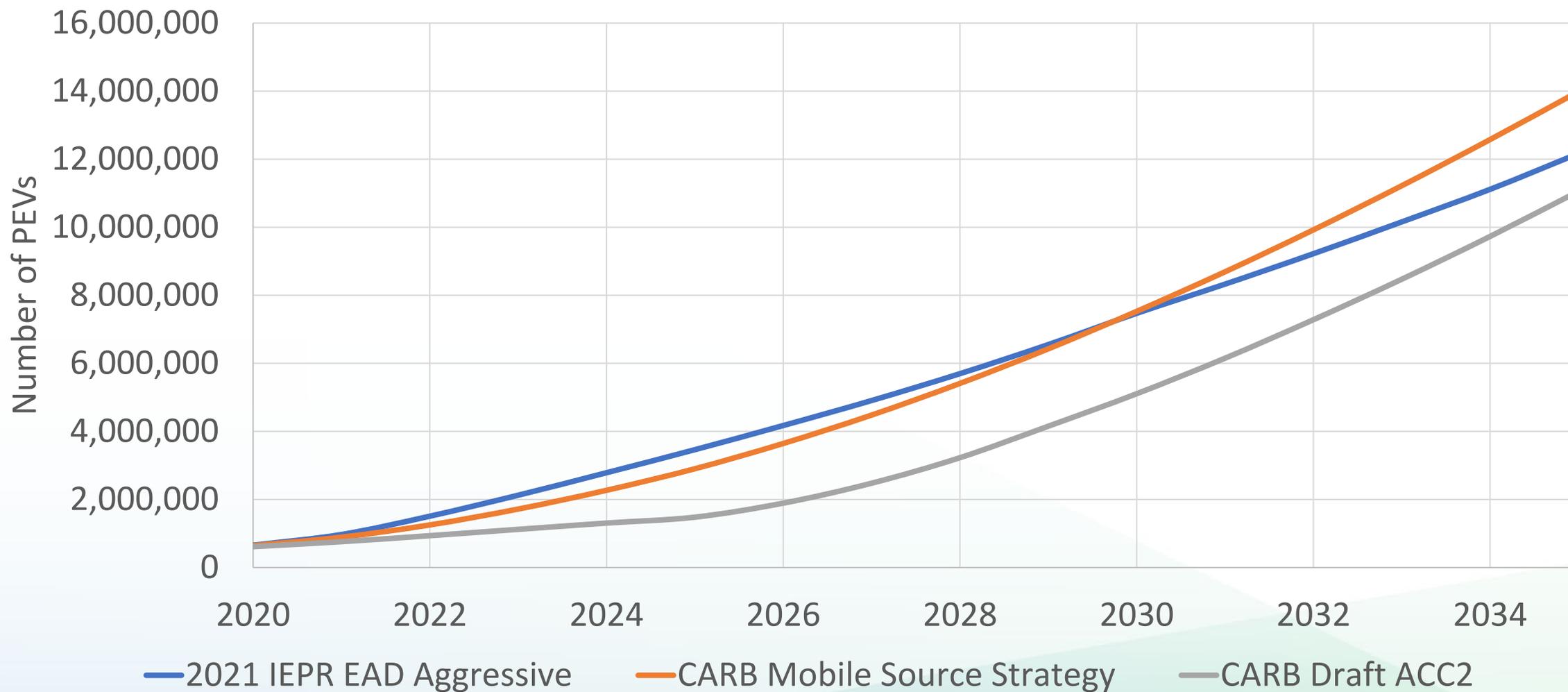
Vehicle Distribution in California

- Vehicles distributed according to current DMV county-shares of light-duty vehicles for vehicles 5 years old or less

- Assume that 77% of fleet resides in single-family homes, 23% in multifamily homes

Vehicle Attributes: Range

2030 Fleet Average Electric Range
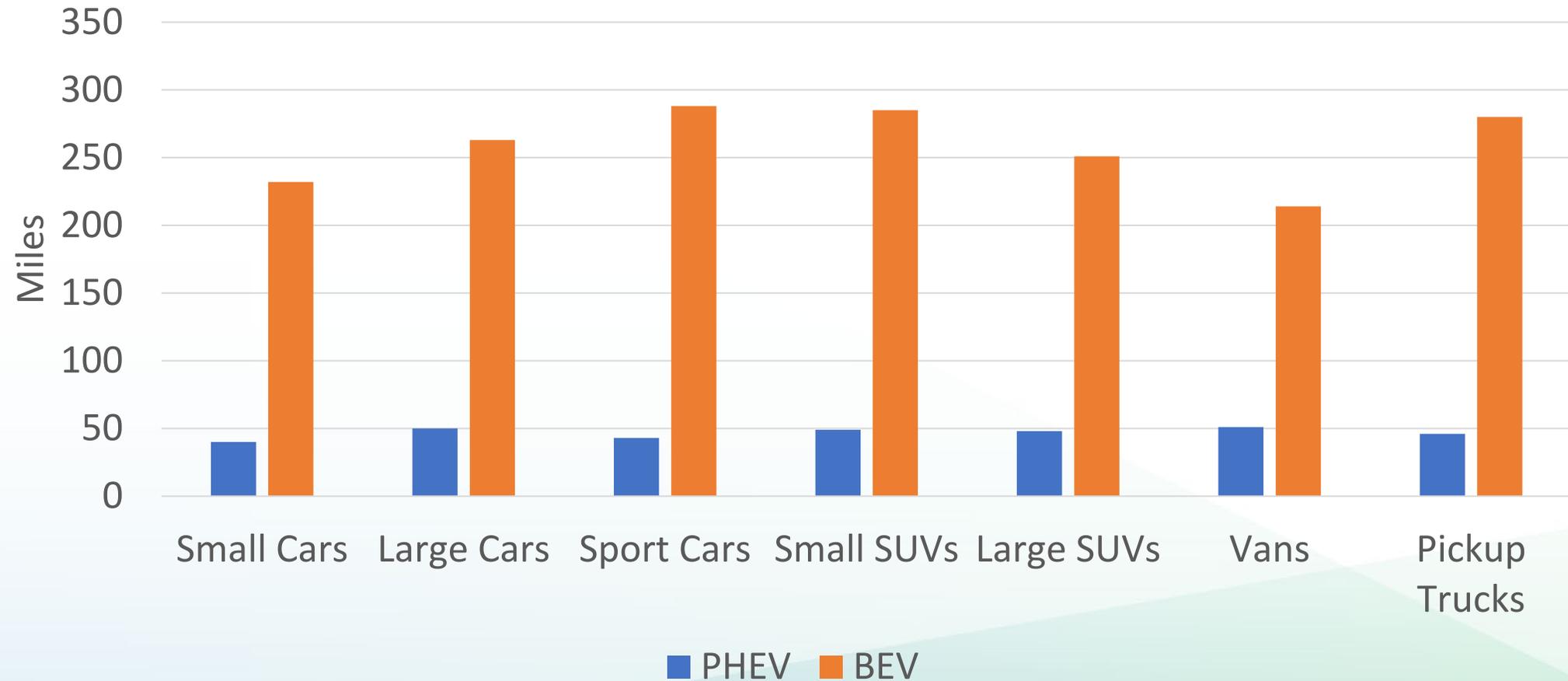
Vehicle Distribution and Attributes

- Are there other approaches or assumptions we should use for the distribution of PEVs in the state?

- Are the attributes we used in the first assessment in line with what you are expecting in the market?

- Are there other considerations, trends, or data we should consider as we update vehicle attributes?

Travel Data

- 24-hour travel profiles from the 2012 California Household Travel Survey

- Supplemented with the California subset of the 2017 National Household Travel Survey

- Understand when and where drivers travel, the type of destination, how long vehicle is dwelled, etc.

CHTS County-by-County Travel Patterns
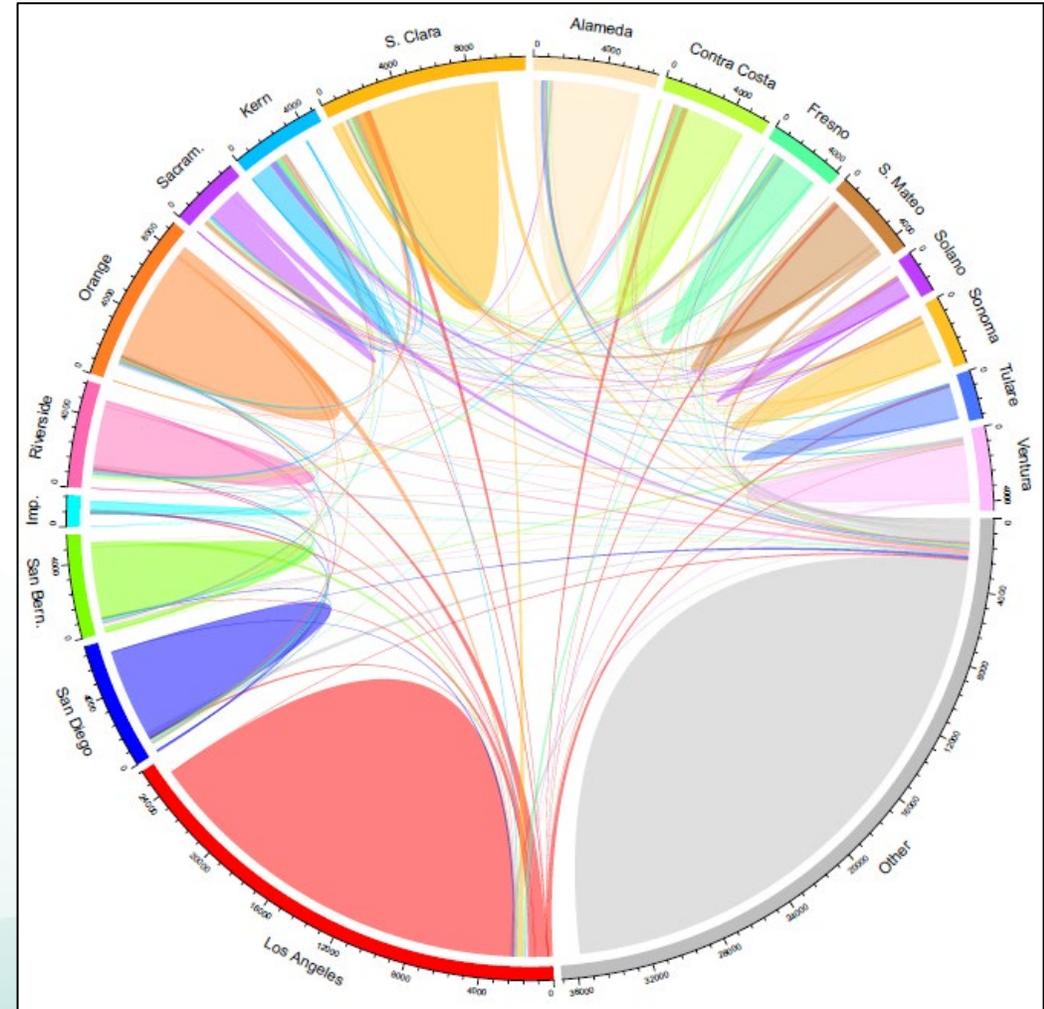
Charging Behavior and Preferences

- Calibrated charging behavior based on UC Davis research

- Simulate drivers to prioritize the lowest cost charging option available to them (typically home charging)

- Simulate PHEV drivers to maximize electric miles traveled
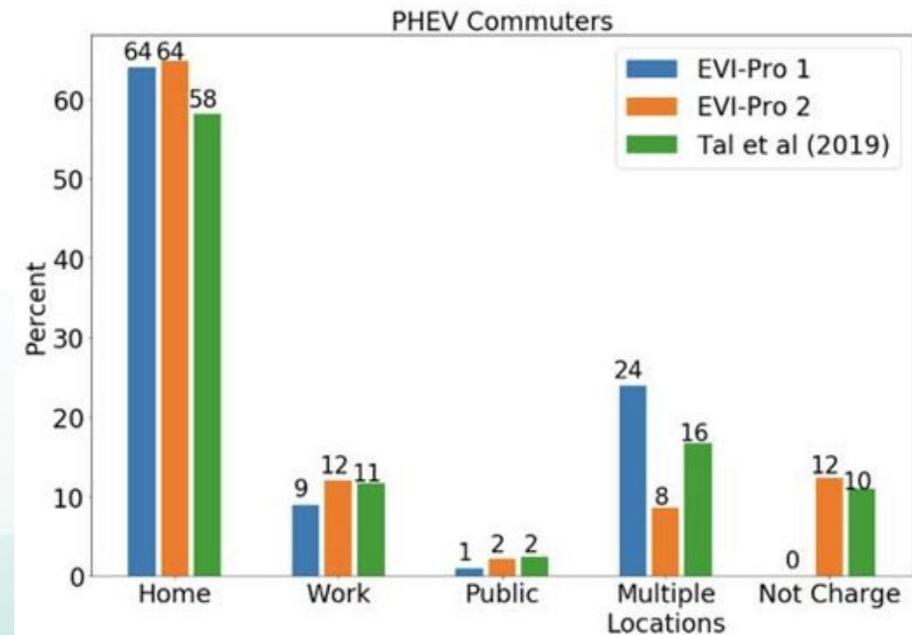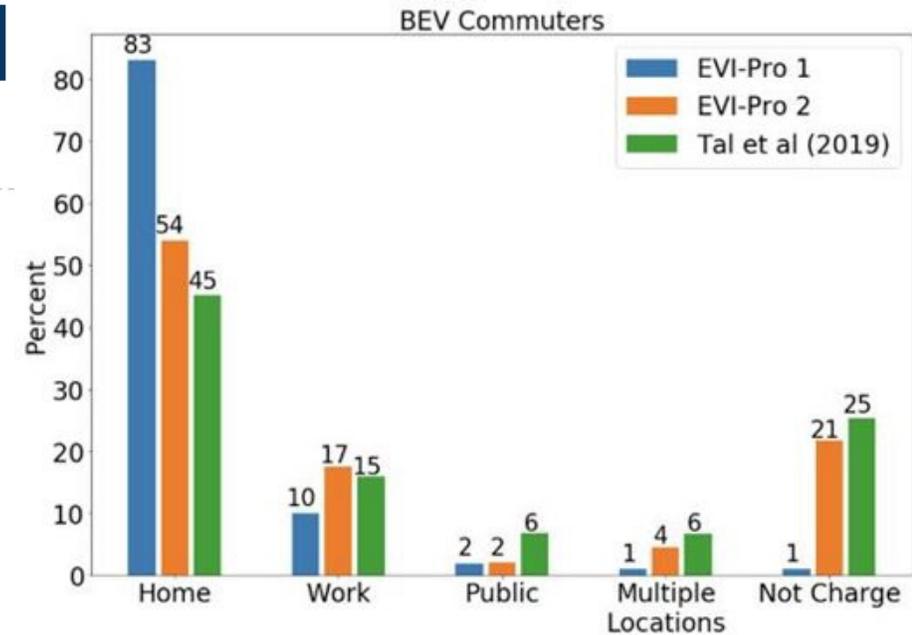
Charging Behavior and Preferences

- Assume charging type preferences as follows:
  - Home > Work Level 2 > Public DCFC > Public Level 2

- TOU participation for home charging
  - Participation rates forecasted by Energy Assessments Division staff

Is driver on a TOU rate?

NO

YES

Driver will plug in vehicle immediately upon arrival

50% will delay charging until midnight

50% will delay charging to replenish energy needs upon departure time in morning
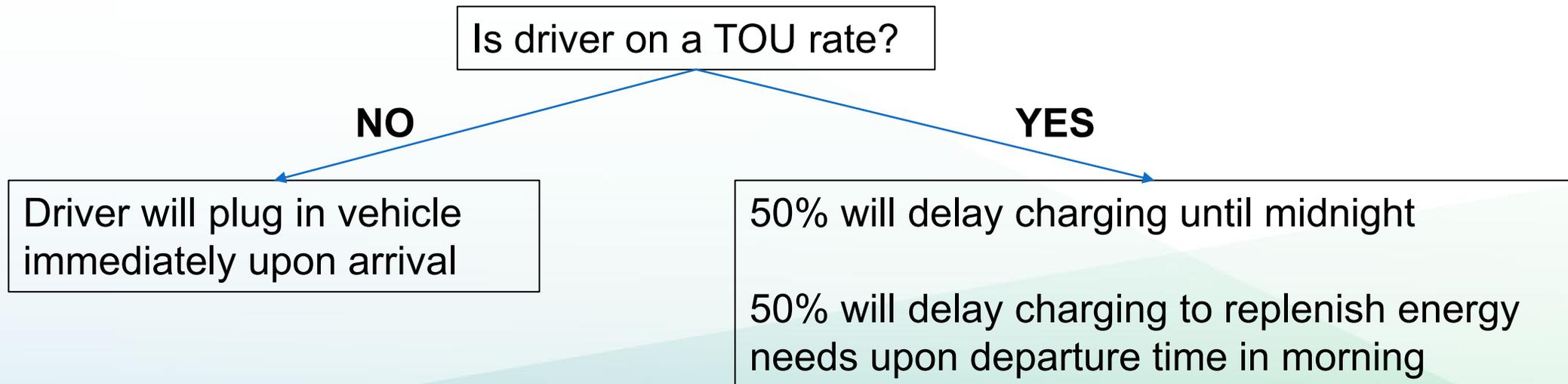
Charging Behavior and Preferences

- Adding new options for charging (e.g., curbside chargers)

- More robust DCFC power levels

- Re-evaluating treatment of PHEV eVMT

Home Charging Access
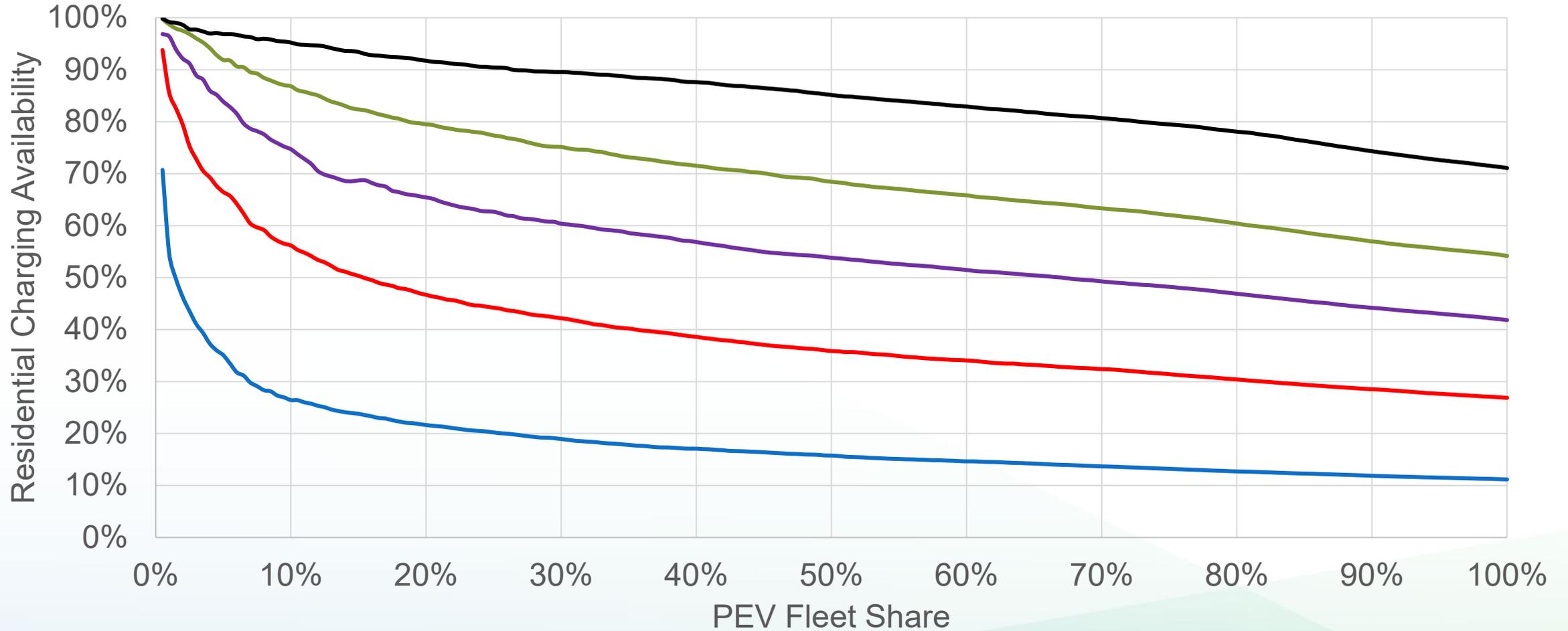
Residential Charging Availability vs. PEV Fleet Share

Legend:
- Existing Access with 120V Perception
- Existing Access
- Potential Access
- Existing Access with Parking Behavior Modification
- Potential Access with Parking Behavior Modification

Assume Potential Access Scenario in EVI-Pro simulations
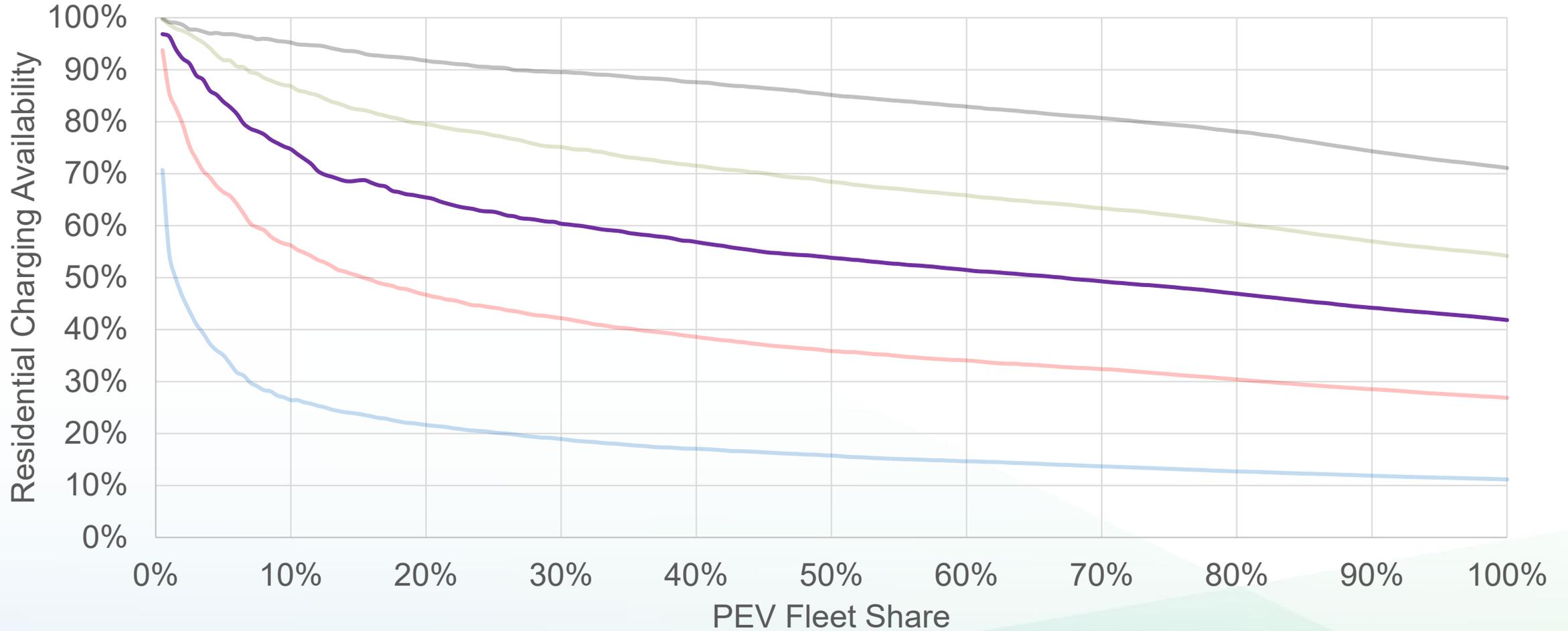
Chart: Residential Charging Availability (y-axis, 0%–100%) vs PEV Fleet Share (x-axis, 0%–100%)

Legend:
- Existing Access with 120V Perception
- Existing Access
- Potential Access
- Existing Access with Parking Behavior Modification
- Potential Access with Parking Behavior Modification

Charger Utilization

- DCFC and public L2 utilization based on historical data
- Workplace L2 assumed to serve 1 – 2 events per day
- MFH L1 assumed to serve ~1.0 – 1.1 events per day
- MFH L2 assumed to serve 1 – 2 events per day
- SFH L1 and L2 assumed to serve 1.0 – 1.1 events per day

Charger Utilization

- Are there other approaches or assumptions we should use for future utilization?

- Is there more recent and/or robust utilization data stakeholders could provide (especially high-powered DCFCs)?

EVI-Pro Outputs

Infrastructure Network

- Number of chargers by type (home, work, public L2, public DCFC)

- Location of chargers at the county level

Legend:
- Chargers needed for 5 million ZEVs
- Additional chargers needed for 8 million ZEVs

Category	Chargers needed for 5 million ZEVs	Additional chargers needed for 8 million ZEVs	Total
Workplace	188	139	327
Public	278	192	470
Multi-Unit	224	106	330
DC Fast			37
Total	714	451	1,164

Chargers (in thousands)
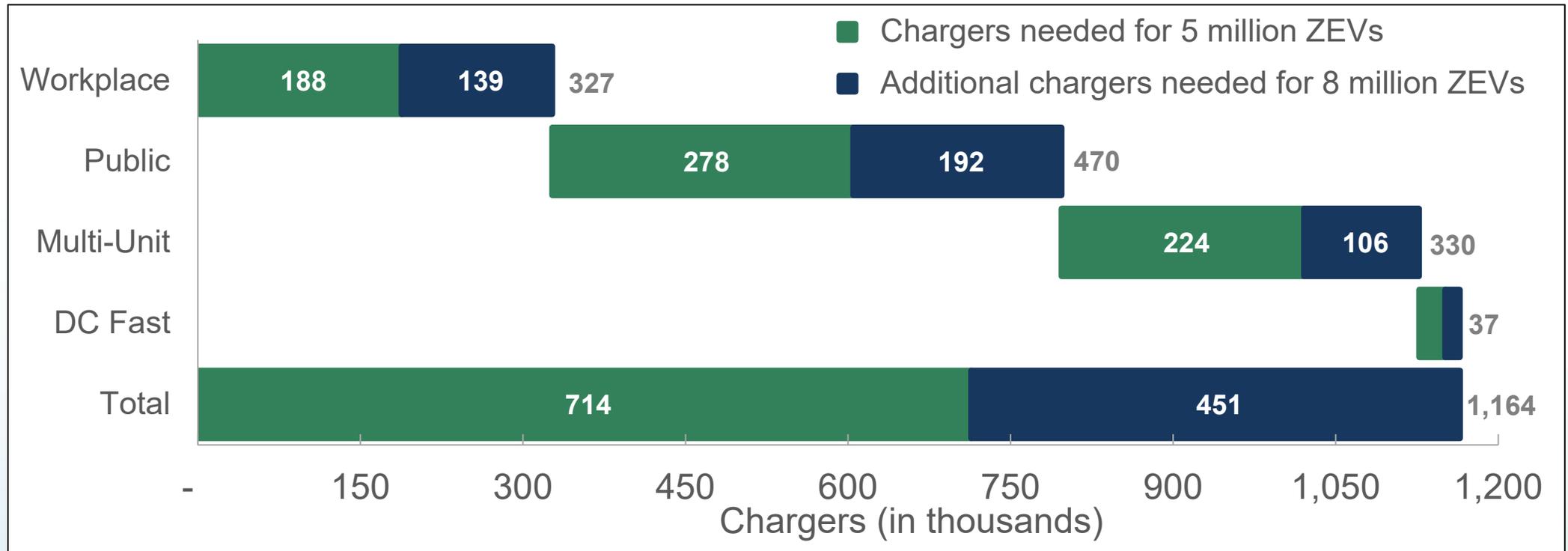
Load Profiles
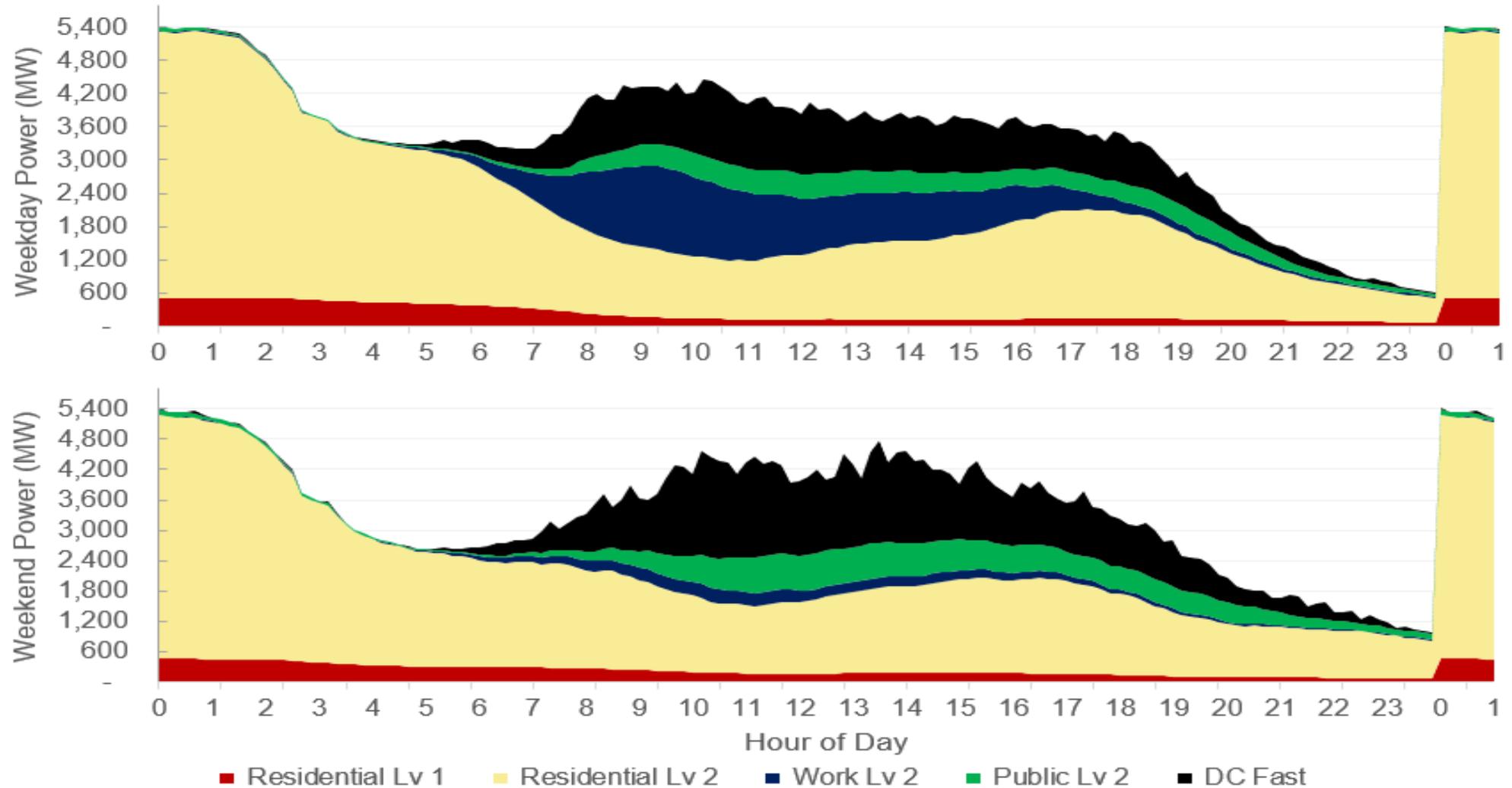
New Output Metrics

- Planning to automate many metrics in the outputs of the model:
    - Average annual energy throughput per charger
    - Average energy delivered per charging session
    - Average utilization (hours used) per charger
    - Estimated GHG emissions from charging (and GHG emissions avoided)
    - Electric miles traveled
    - Others?

Alternative Future Scenarios
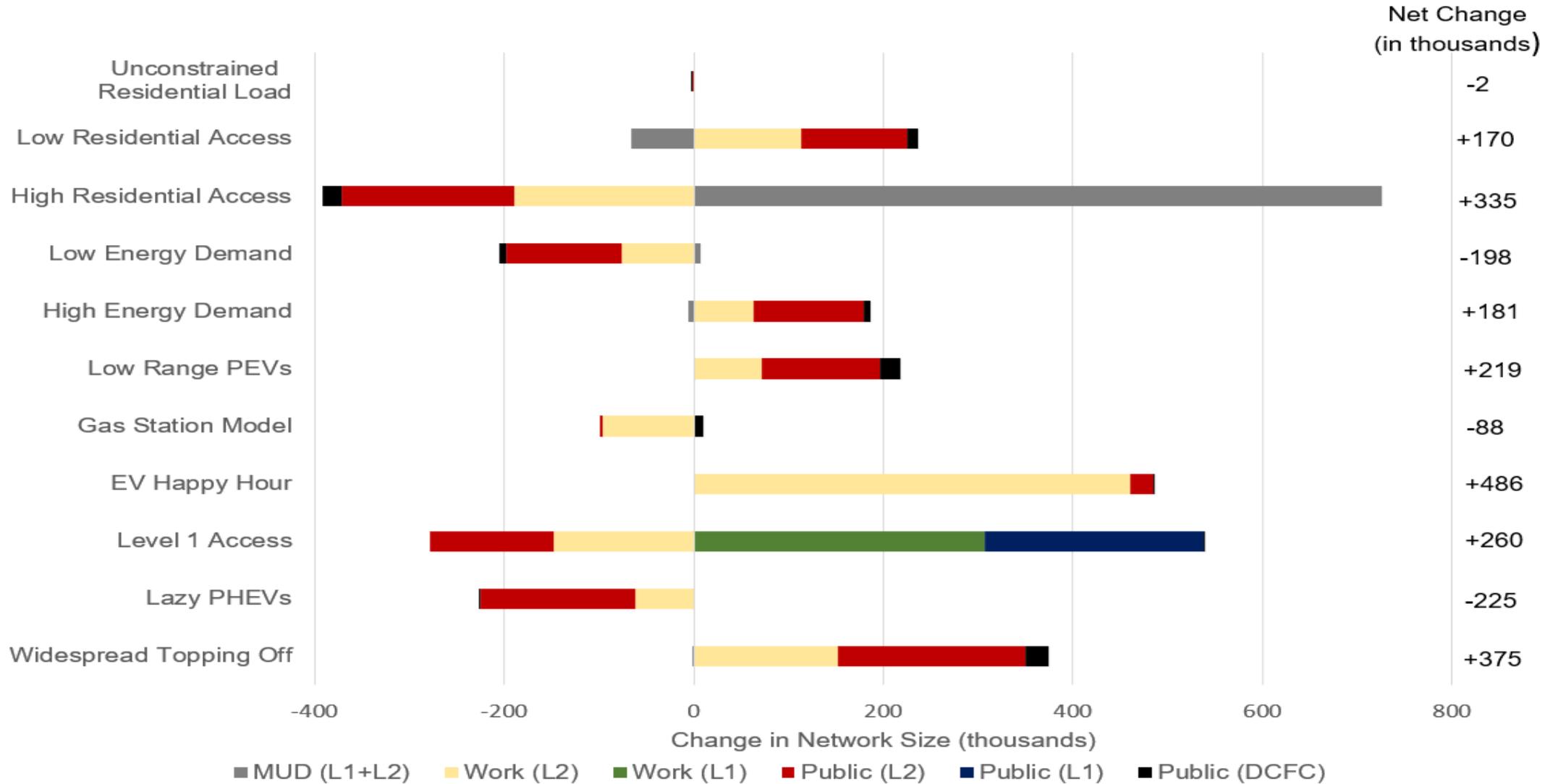
Alternative Futures

- Are there more types of scenarios or conditions we should explore when considering uncertainty in the future?

- Are there other sensitivities in the model you would like to see?

Future Model Updates

Key Updates for 2nd Assessment

1) Enhanced geographic resolution
   - Aiming to get results at the traffic analysis zone level
   - Leveraging UC Davis' EV Toolbox

2) Smart charging analysis
   - Incorporating elements like pricing signals to influence charging behavior and explore V1G and V2G smart charging scenarios

3) Integrating different infrastructure models to output composite results

Smart Charging Analysis

- How should we consider and test smart charging? What kinds of scenarios should be prioritized?

- Are there data sources you recommend or could provide to inform smart charging trends and behaviors?

Public Discussion

Zoom Participants:

- Use the "raise hand" feature to make verbal comments

Telephone Participants:

- Dial *9 to raise your hand
- Dial *6 to mute/unmute your phone line.

Written Comments

Electronic Commenting System

Visit the comment page for this docket at:
https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=19-AB-2127

All comments due by Friday, March 25, 2022

Thank You